Making AMDAL a Tool for Road Planning in Forests In Indonesia

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Discussion Paper

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1.0 THE PROBLEM

Environmental impacts of roads in forests are not commonly used as a planning rationale for public transportation planning in Indonesia. Routes for roads are often aligned along former logging roads. When former forest concession (HPH) and forestry plantation (HTI) roads are converted to public roads, most primary environmental impacts have already taken place.

The conversion of logging roads to public roads is mainly carried out for cost reasons. Using existing road networks for upgrading has potential environment benefits. *However, conversion of private forestry roads to public roads is not addressed in the Environmental Impact Assessment (AMDAL) documents for the respective HPH or HTI concessions*. This creates a potential loophole concerning the environmental assessment process as upgrading of existing roads to public road standard may not be considered environmentally damaging since the related primary environmental impacts have already taken place.

Without this stage of environmental review the significant secondary environmental impacts of roads are never seriously evaluated. *Data on secondary impacts of roads such as encroachment, illegal logging, and forest fires are not commonly available for transportation planning and therefore are not formally considered by planning authorities.* However, there is an awareness of these issues among regional planning officials.

Data on existing roads are incomplete at the regional planning level. For example, a comprehensive inventory of existing main forestry roads is not available for regional transportation planning purposes by the Provincial Planning Agency (BAPPEDA Tingkat I) in East Kalimantan (Kaltim). This makes it unlikely that planning decisions for roads in the past included environmental considerations. *It also demonstrates institutional weaknesses in interagency coordination and data transfer*. Commonly, this can lead to resource use conflicts between various governmental agencies involved in land management. Also, unintended encroachment and forest conversion may disrupt planned development or land uses.

On the technical level, the present AMDAL practice does not encourage the implementation of environmental best practices in road design, construction and operation. A review of HTI and HPH AMDAL documents in East Kalimantan has shown that environmental impacts of roads are generally covered under major environmental impact sources such as land clearing for logging or conversion into industrial timber plantations. Vague 'guestimates' of secondary impacts of roads are given. Often no site-specific recommendations are made in the Environmental Management Plan (RKL) and Environmental Monitoring Plan (RPL) on how to mitigate primary and secondary road impacts.

The present format of AMDAL documents is too wordy and not application friendly. Management and operational staff concerned with road design, construction and operation are not encouraged to base their decisions on AMDAL recommendations.

The design and environmental standard of roads in forested areas is low. Decisions on forestry road alignments are often made on the bulldozer, leading to massive disruptions in natural ecosystems. With the conversion to public roads these environmental damages are manifested

and aggravated by secondary impacts when areas become more accessible as roads are upgraded.

AMDAL could provide missing road planning data, but the process is generally done too late.
In the past budgets for AMDAL and construction of roads were approved together by the central authorities in Jakarta. Influences on road alignments and management according to predicted environmental impacts are impossible under these circumstances. The AMDAL is left to confirm and justify a proposed road alignment, rather than being part of an integrated transportation planning process at the beginning. One such case is the environmental impact study for the Bontang-Sangatta section of the East-Coast Trans-Kalimantan Highway, which traverses the Kutai National Park (Penyajian Informasi Lingkungan [PIL], Proyek Pembangunan Jalan dan Jembatan Bontang-Sangatta, 1990).

On a positive note, thanks to interventions by non-governmental organisations in Indonesia this has been recently addressed, and budgets have been better scheduled for new projects such as a planned road traversing the Kayan-Mentarang National Park in East Kalimantan. A budget of Rp.200 million has been requested for AMDAL to commence prior to construction of the road (pers. comm. BAPPEDA I Kaltim and Kayan-Mentarang Office/ WWF Indonesia).

This paper is aiming to raise the awareness further to reduce institutional and technical weaknesses concerning the implementation of AMDAL for roads and to stimulate a cross-sectoral dialogue among agencies concerned with roads in forests in Indonesia. This paper resulted from issues raised during a 3-month consultancy to study transportation planning and protected areas in East Kalimantan, conducted during October to December 1998.

2.0 EXISTING RULES AND REGULATIONS REGARDING AMDAL AND ROADS

A comprehensive set of environmental laws, regulations, and decrees govern the environmental impact assessment process (AMDAL) in Indonesia, many of which have relevance for road planning in natural environments such as forests. Excerpts of environmental laws and regulations with relevance to AMDAL and roads in forested areas are given in Table 1 (Indonesian text is legally binding). The key element of AMDAL is the EIA study (ANDAL) with the aim to identify and describe potential significant environmental impacts of a planned activity or business (including alternatives and no action options) ***prior*** to commencement of the activity or business. Environmental Management Plans (RKL) and Environmental Monitoring Plans (RPL) describe abatement and mitigation measures as well as control measures regarding the implementation of environmental management practices.

The legal framework for the implementation of AMDAL in Indonesia has been created. In the past these laws and regulations have been amended to optimize and simplify the process of environmental impact assessment.

Of importance is that the Decree of the Minister of State for Environment No. KEP-11/MENHLH/3/1994 concerning the types of businesses or activities required to prepare an

environmental impact assessment, specifies *construction and upgrading of arterial and collector roads of more than 5 km in length require AMDAL*.

This would concern projects in which HPH/HTI roads are converted into public roads by upgrading them to gravel or paved roads if they meet the other specifications. In the Forestry sector, HPH and HTI concessions of more than 100 hectares in size are requiring AMDAL. *Following the above, forestry roads should be more extensively covered in the AMDAL for forestry concessions, and then should be reassessed concerning their environmental impacts when upgrading to public roads takes place if the above criteria are met*. There are significant shortcomings in the implementation of these regulations, which will be discussed later.

TABLE 1: RELEVANT ENVIRONMENTAL LAWS, REGULATIONS AND DECREES CONCERNING AMDAL AND ROADS

Laws/ Regulations	Relevant Sections (translated)	Relevance for road planning process
Environmental Act Number 23 of 1997	Chapter 1, Article 1 20. Environmental impacts are disturbances to the environment, which caused by any activities; 21. Environmental impact assessment is a comprehensive study of important and significant environmental impacts caused by planned activities which will be used for decision making for the particular activities. Chapter V, Article 14 1. To ensure the preservation of environmental functions, all activities are forbidden which are exceeding the standard and criteria set for environmental impacts; 2. Standards for prevention and mitigation of pollution as well as recovery are regulated by Governmental Regulations; Chapter VI, Article 18 1. Every single activity that is potentially causing significant environmental impacts is required to conduct an environmental impact assessment (EIA) in order to be granted a permit of operations; 2. The permit of operations as stated above is endorsed by respective governmental agencies as regulated under the law. Elucidation of Environmental Act Number 23 of 1997 Article 15, Clause 1 The criteria for significant impacts: a) The size of population that would be affected by the activities; b) The area coverage; c) The intensity and length of the impacts; d) The number of impacted environmental components; e) The cumulative impacts; f) The reversibility or irreversibility of the impacts.	☝ "…Will be used for decision-making for the particular activities" means an early EIA to allow for decision-making based on adequate data prior to project activities. This implies also the possibility of a "no-go"-option if serious environmental impacts cannot be adequately mitigated. ☝ Secondary impacts of road construction/upgrading are covered by significant impacts criteria and should be addressed in the EIA.
Decree of the Minister of State for the Environment KEP. 11/MENLH/3/1994	An AMDAL for Public works Sector (roads) is required for: • Construction of toll roads and highways and fly-overs • Highway construction length ≥ 25 km • Arterial and collector road construction and upgrading outside of large cities or metropolitan areas: length ≥ 5 km.	• Conversion from HPH to public road (≥ 5 km) can be considered an upgrading activity, requiring AMDAL.

Government Regulation Number 51 of 1993 *concerning Environmental Impact Assessment*	Part I, Article 1, Paragraph 10&11 10. An environmental management plan (RKL) is a document presenting those efforts that will be made to manage the significant environmental impacts, which will result from a proposed business or activity. 11. An environmental monitoring plan (RPL) is a document presenting those efforts that will be made to monitor the environmental components which will be subjected to significant impacts arising from a proposed business or activity. Part I, Article 2 1. The types of businesses or activities, which are predicted to have significant impacts on the environment shall include: ▪ Modifications of landforms and the natural landscape; ▪ Exploitation of renewable and non-renewable natural resources; ▪ Processes and activities with the potential to cause waste, damage and a decline in natural resource utilization; ▪ Processes and activities which may affect the social and cultural environment; ▪ Processes and activities which may affect the preservation of natural resources conservation areas and/or the protection of cultural reserves; ▪ Introduction of new species of plants, animals and microorganism; ▪ Production and use of biotic and abiotic substances; ▪ Application of technologies which are predicted to have considerable potential to affect the environment; ▪ Activities having high risks and affecting national security.	☝ Describing the EIA process and documentation
Presidential Decree No. 32 of the Year 1990 (dated July 25, 1990) concerning the Protected Area Management.	This decree contains the technical guidelines for setbacks from Protected Area boundaries.	☝ Setback guidelines are relevant for road planning purposes (e.g. streams and tributaries).
The Law No. 5 Year 1990 concerning the Biological Resources and Its Ecosystems	b. The conservation of the biological resources and its ecosystem will become the responsibility and obligation of both the Government and the Public (Chapter I, Article 4). c. The conservation of the biological resources and its ecosystem will be carried out through the following activities (Chapter I, Article 5): I. Protection for the life buffering system; II. Preservation on variety of flora and fauna and its ecosystem; III. Sustainable use of the biological resources and its ecosystem. d. Each land title ownership holder that has activities that affect the waters available in life buffering systems shall have to maintain the sustainable function of the above mentioned protection areas (Chapter II, Article 9, Paragraph 1).	▪ General

	e. Whoever is responsible for lands containing the life buffering system areas that incur natural or man made damages, shall be responsible for planned rehabilitation efforts (Chapter II, Article 10).	
The Law No. 4 of Year 1982 regarding the Principles of Environmental Regulations	• The environmental damage is the action creating a direct and/or indirect adverse impact of a physical nature (characteristic) and/or environmental biology that causes environmental degradation or not be able to function anymore to support sustainable development (Chapter I, Article 1). • The environmental development is a conscious and planned effort to wisely use and manage the natural resources for sustainable development in order to increase the quality of life (Chapter I, Article 1). • Anybody doing business has to maintain the environmental capacity and conservation in an harmonious and balanced condition in order to support sustainable development (Article 7). The Penal Laws are: • The law and implementation regulations can contain criminal law in the form of prison punishment or confinement and/or fine (Law No. 5/1967, Chapter IV, Article 19, Paragraph 1). • The criminal action in paragraph (1) according to its act classification can be distinguished between a crime and violation (Law No. 5/1967, Chapter IV, Article 19, Paragraph 3). • Whoever intentionally does an illegal act causing environmental damages or environmental pollution which are stipulated in this Law or in other regulations shall be threatened by a prison punishment for not more than 10 years and/or by a fine of not more than Rp. 100,000,000 (One Hundred Million Rps.) If environmental damage occurs incidentally (due to carelessness) the person causing such damage shall be threatened with not more than one year crime punishment and/or fined not more than Rp. 1,000,000 (One Million Rps.).	▪ General
The Law No. 5 Year 1967 pertaining to the Main Forest Regulations	The forest needs to be protected so that it could sustainable fulfill its functions as stated under Article 3 (Chapter V, Article 15). This Article 3(4) mentioning that; a. "Hutan Wisata" having the beauty by nature, its flora, fauna as well as its own natural beauty which has the special character utilised for culture and recreation interest is called "Taman Wisata". • The Forest Conservation shall cover the following efforts: ▪ To prevent and limit forest and forest product damages caused by livestock and human behaviour, fires, natural power, pest and plantation diseases.	▪ General

3.0 SECTORAL AND INSTITUTIONAL ISSUES RESPONSIBLE FOR ENVIROMENTAL IMPACTS OF ROADS IN FORESTS

Cases from two Indonesian provinces, East Kalimantan and West Sumatra, are presented here to describe sectoral and institutional weaknesses leading to poor road planning and negative environmental impacts in the context of roads in forests. Both cases show causal similarities why road planning or construction processes are currently posing severe threats to the forest environment.

3.1 REGIONAL TRANSPORTATION PLANNING IN EAST KALIMANTAN

Indonesia's East Kalimantan province (Kaltim) has 45% of its land area under management control by the Forestry Department. The provincial spatial plan (Rencana Tata Ruang Wilayah) for East Kalimantan is prepared by BAPPEDA Tingkat I. A new Five Year Spatial Plan was due to be completed last year in December. The execution of road works is in the hand of the Public Works Department Units (PU).

In 1997, a provincial Environmental Management Agency (BAPPEDAL-DA) was established in the province. An integration of AMDAL in the transportation planning process in East Kalimantan has yet to be achieved. AMDAL is only provided during or after road construction. Thus, AMDAL is seen as an administrative necessity and serves to confirm and justify a proposed road project at best. One such case is the environmental impact study for the Bontang-Sangatta section of the East-Coast Trans-Kalimantan Highway, which traverses the Kutai National Park (Penyajian Informasi Lingkungan [PIL], Proyek Pembangunan Jalan dan Jembatan Bontang-Sangatta, 1990).

According to the Head of the AMDAL Department at BAPPEDAL-DA, the regional environmental management agency is not regularly involved in the consultation process with the Public Works Department. For the AMDAL review process, BAPEDAL-DA is invited to central AMDAL commission meetings in Jakarta, presenting views but not making decisions. There is still a great reliance on the central Environment Management Agency BAPEDAL.

Although officials report that there are interagency meetings on provincial levels to discuss planning issues, crucial road planning inputs from other agencies such as the important Forestry Department are not forwarded to the regional planning authorities. The planning staff of the provincial transportation planning unit at BAPPEDA is not reliably up-dated on the status of forestry roads and progress of road upgrading executed by the Public Works Department Units. This was found during field surveys carried out last year to establish the least impacting road alternatives traversing the proposed Sebuku-Sembakung protected area (*NRM2 Project – Bioregional Planning Kaltim*). Most of the proposed sections for the Trans Kalimantan Highway in the Sebuku-Sembakung area were already in place and had been upgraded from HPH dirt roads to public gravel roads by PU – without AMDAL.

A proposal to the Governor last year included the establishment of an inter-agency coordination group to jointly advise the Governor on planning policy issues, as well as a technical team to

advise in technical matters. It remains unclear, if this proposal was developed further in the course of the recent general elections in Indonesia.

Summary of Points:

- Crucial road planning inputs from other government agencies are not forwarded to the regional planning authorities.

- Interagency coordination and decision-making on provincial level is still weak, dependence on top-down instructions and decision-making by central government's sectoral agencies.

- The AMDAL is contributing little or nothing to the planning and management of roads as it is not implemented prior to road upgrading.

- HPH/HTI AMDAL studies generally do not contain useful site-specific guidance for road planning, management and monitoring in concession areas.

3.2 WEST SUMATRA ROAD PROJECTS IN PROTECTED FORESTS

In this province the GOI is establishing and managing the Kerinci Seblat Integrated Conservation and Development Project (ICDP) with a loan from the World Bank. However, in 1996 the Jalan Kambang-Muara Labuh road had been constructed approximately 7 km into the park without authorization. The road was stopped and a "permanent" barrier was installed by Dinas PU to block the road and to stop illegal logging in the park aided by trucks. Other encroachments by settlers immediately after the road opening in July/August 1996 continued up to 1997, when a World Bank Mission noted several new "Ladangs" alongside the road as well as evidence of illegal timber extraction despite the barrier at the road entrance. This demonstrates how significant and fast-spreading secondary impacts of roads can be for forests along these roads.

Although this section of the Kerinci Seblat National Park has been classified as protected forest (HL), the Provincial Strategic Structure Plan still included the Jalan Kambang-Muara Labuh road project. Further research by the World Bank revealed that according to the West Sumatra Kanwil Forestry, there were 22 other roads planned (or under construction) in officially designated nature conservation areas or HL.

The Bank concludes that resource use conflicts are not being resolved in sectoral and comprehensive provincial spatial planning processes, and consistency with the Strategic Structure Plan cannot be taken as an unambiguous indication of the suitability of a proposed road alignment. Dinas PU staff claimed to have been unaware of Forestry's objection to the Jalan Kambang-Muara Labuh road. However, PU did not comply with the requirement to complete AMDAL and seek permits from other agencies for the construction of the road prior to commencement. A later submitted (reference is made to the observations in Kaltim) ANDAL (EIA study) for the road was found to be very poor by GOI and World Bank standards. It did not contain any substantive mitigation measures for the most serious impacts

it identifies – disturbance of wildlife including rare species – and the measures it does recommend for other impacts are not sufficiently concrete or specific. Even they are not being implemented; they are probably not being incorporated in the construction contract, and supervisors are evidently not concerned about environmental impacts.

An ANDAL for a road with serious and irreversible impacts in a protected area would be expected to contain a comparison of alternatives including a "no action" option. Another important feature, a set of specific recommendations for alignment and design to minimise adverse environmental impact, is also missing in the ANDAL.

- Planning of new roads is not adequately integrated with planning in other sectors, and resource use conflicts between sectors exist in the provincial comprehensive plan.

- Interagency coordination is weak in road projects, and requirements of other agencies, especially Forestry, are being ignored by Kanwil Bina Marga and Dinas PU.

- Roads planning and design are not sufficiently sensitive to the environment.

- AGAIN- the AMDAL is contributing little or nothing the management of road impacts at any stage-planning, design, or construction.

- Many road construction practices are unsatisfactory, particularly with respect to handling of excavated material and to preparation and protected of subgrade.

- Supervision by Dinas PU West Sumatra is ineffective in controlling quality of work or protection of the environment.

3.3 STARTING A SOLUTION PROCESS

It becomes obvious from the above cases that transportation planning and AMDAL for roads are not approached and understood as an integrative multi-sectoral process. That leads to inadequate data exchange and resource use conflicts between sectors.

Interagency coordination between planning and executing authorities for roads is poor. The tool AMDAL can provide for a proper road design and management process is at best overlooked, in other cases bluntly disregarded. The commitment level to executing high-quality road projects without serious adverse environmental impacts is lacking, though highly-qualified, well-trained civil engineers are available at Dinas PU level in West Sumatra according to the World Bank.

Directions for Improvement:

- In East Kalimantan initiatives to establish an interagency coordination group started prior to the recent elections. The coordination group will have to include key stakeholders such as BAPPEDA, Forestry, PU and BAPPEDAL-DA. Resource use conflicts can be identified at

an early stage and properly addressed by information-sharing. The technical experts can conduct initial environmental screening of new road projects in interagency coordination meetings.

- Planning authorities like BAPPEDA I can coordinate alignment and standard of main forestry roads with Forestry and the concessionaires with a view at future conversion to regional public roads. Adjustments in the alignment will be possible at an early stage, provided that the operational functions of the logging roads are not compromised. Better quality ANDAL studies may provide data for this coordination process. Forestry would need to release data on planned roads by concession holders for review by BAPPEDA.

- AMDAL and environmental best practice training can include staff of BAPPEDA and PU to establish a broader understanding of AMDAL as a tool for quality planning and management. AMDAL training can focus on specific agencies' needs, for instance, PU (design and construction), BAPPEDA (planning and design) and BAPPEDAL-DA (planning, management and monitoring).

- Data on environmental economics of secondary encroachment impacts can help planning authorities to evaluate these environmental aspects. These assessments would need to be commissioned, as these impacts have not been evaluated a systematic manner for roads in Indonesia.

- Guidelines on how to assess transportation alternatives to roads and respective environmental economics would be a useful decision-making tool for regional transportation planning.

- ANMDAL studies can provide specifications for environmental measures for road contracts and tender documents. AMDAL consultants have to include this in their scope and need to be qualified to provide these inputs. AMDAL consultants should also be required to initially review regional transportation plans in the context of the forestry roads to predict secondary impacts of forestry roads.

- Interagency coordination can become a criterion for international project funding.

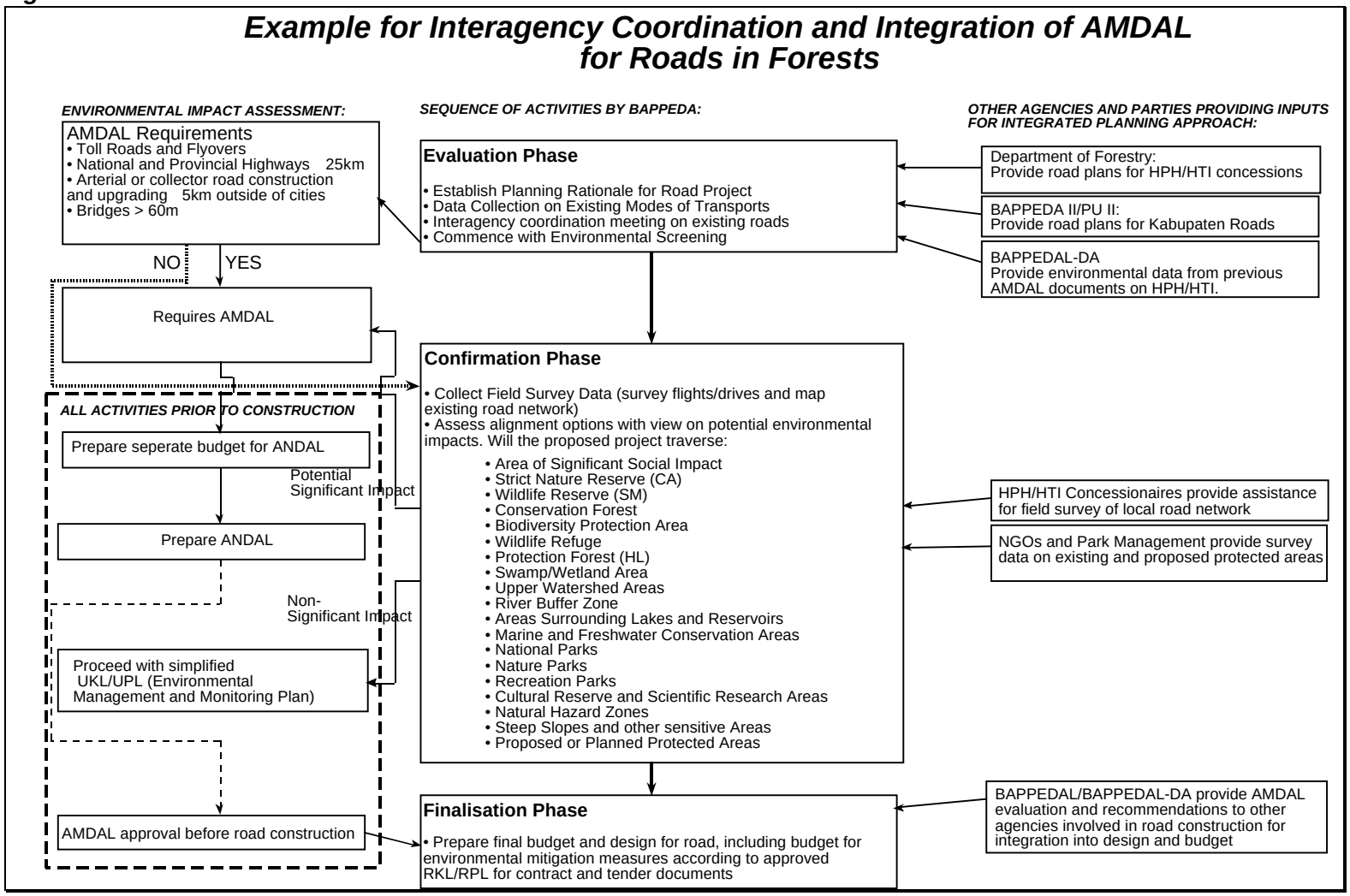
- Financial incentive schemes for compliance with AMDAL recommendations and a minimum environmental standard for road construction can be considered for forestry concessionaires (Forestry Performance Bonds) and PU (Construction Performance Bonds).

The flowchart in **Fig.1** below outlines an example for improved interagency coordination for road planning. It further highlights the integration of AMDAL as a tool for road planning and management. Note that the recommendations of the ANDAL study and the AMDAL commission are fed back to provide also the necessary specifications for road contracts and tender documents.

In a practical example, the ANDAL study will evaluate the number and quality of watercourses along the planned road alignment. These data will be used to specify the size and number of silt

traps and culvert pipes for inclusion into the tender documents. PU or other subcontractors will have to provide a cost estimate for these measures as part of the construction budget. Specifications and costs for environmental measures will be included into the road contract. The Environmental Monitoring Plan (RPL) will specify the environmental monitoring parameters and frequencies to control the implementation of all identified environmental measures during construction. BAPPEDAL-DA will review environmental monitoring reports and will conduct spot checks.

Fig. 1: Flowchart



4.0 TECHNICAL ISSUES

For the parties involved in construction and operation of roads, the Environmental Management Plan (RKL) and Environmental Monitoring Plan (RPL) are most crucial. It was found that in existing ANDAL studies these sections are incomplete, not site-specific enough, have been copied from previous studies and are not in a form to facilitate implementation. Management and operational staff concerned with road design, construction and operation are not encouraged to base their decisions on AMDAL recommendations.

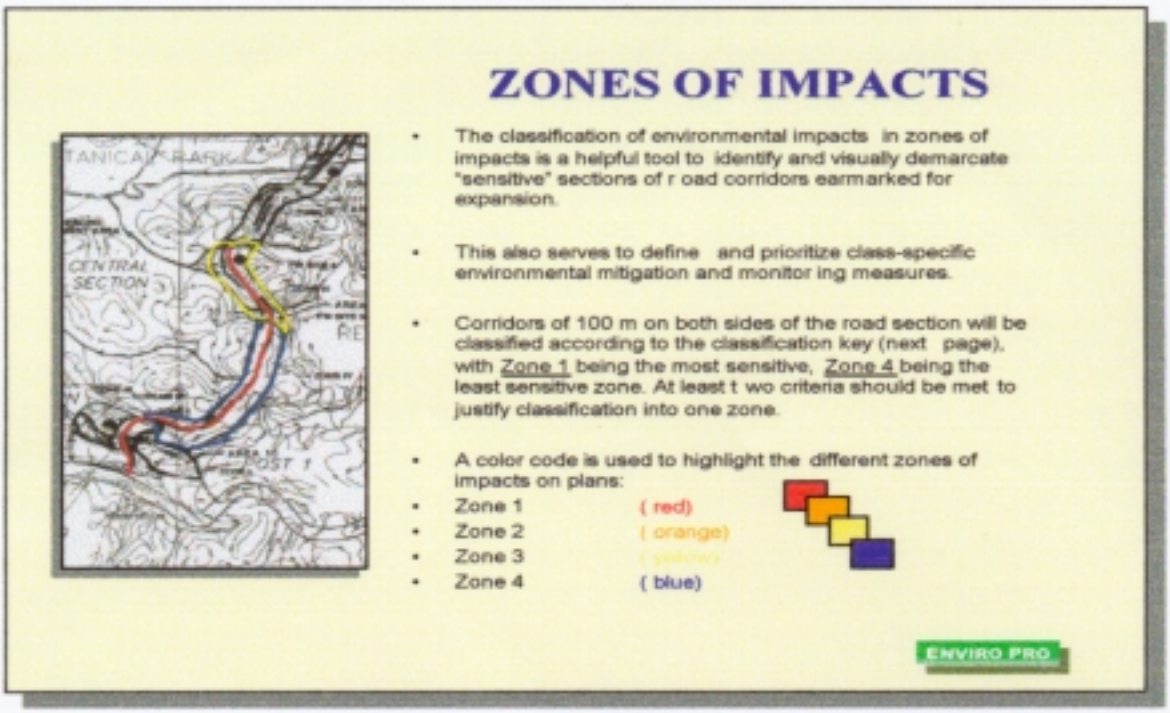
A checklist for good RKL/RPL formatting is given here:

Fig. 2: Checklist for Good RKL/ RPL Reporting in ANDALS for Road Projects

- Most crucial and practical environmental management and monitoring measures are tailor-made to suit site-specific road conditions.
- Avoid general RKL statements on management measures a la "Run off should be prevented".
- RKL and RPL tables of ANDAL studies should be structured following the sequence of road works construction activities (e.g. land clearing, grading, drainage works). In this way it becomes more relevant to the practitioners. This is a difference from existing formats.
- Information on management practices is presented in a visually accessible manner wherever possible with sketches, typical cross sections, dimensions and design details.
- Use of simple language for easy understanding by implementing agencies such as construction contractors.
- Identifies clearly the implementing agencies and responsibilities.
- Environmental management measures are quantified for costing purposes.
- Location details of areas allocated for measures are provided.

The following pages contain some recommended and tested reporting techniques for ANDAL studies for road projects. They may also serve as a basis for discussion with the Environmental Management Agency (BAPEDAL) in Indonesia to review present ANDAL formats in their guidelines and make the recommended changes.

- **Fig. 3: Zones of Impacts as a Planning and Management Tool for Roads**



- **Fig. 4: Presentation of Environmental Measures in Typical Cross Sections**

Table 2: EXAMPLE OF REVISED RKL/RPL TABLE FORMAT FOR ROAD PROJECTS

Structure follows the sequence of road works construction activities (e.g. land clearing, grading, drainage works). In this way it becomes more relevant to the practitioners.

PROJECT AREA	PHASE	ENVIRONMENTAL COMPONENTS WITH SIGNIFICANT EI	ENVIRONMENTAL ACTION	DURATION	IMPLEMENTED BY	ENVIRONMENTAL MONITORING PRACTICES	FREQUENCY	IMPLEMENTED BY
Area 1 Km 120.0-140.0 Zone 2	Con-struction Phase: Clearing and Grading	▪ Slope Stability ▪ Surface Water Quality ▪ Riverine Ecosystem ▪ Noise	▪ Minimise the degree and extent of clearing and grading: Total clearing is only allowed for areas as shown on drawing XYZ. ▪ Strict control of clearing process, provide soil erosion management plans prior to clearing, indicating number and location of silt traps, etc. ▪ Revegetate the cut and fill slopes immediately when grading is completed.	Before initiation of construction (1., 2.) From initiation to end of construction (3.)	Road Engineers (1.) Road Contractors (2.) Landscape Contractor (3.)	• Clearing within allowable limits/ visual inspection • Erosion mitigation and maintenance/ visual inspection • Surface water quality/ water sampling and laboratory analysis • Replanting roadsides with indigenous plant species/ visual inspection	Once prior to clearing, at dates of clearing according to contractor's schedule (1.) Weekly or after heavy rains (2.) Every three months or upon problem identification (3.) Once after completion of construction, then every two months (4.)	Supervising engineer on site (1., 2.) Consultant/ BAPPEDALDA (3., 4.)

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